

## Improved Combustion Products Monitor for the ISS, Phase I

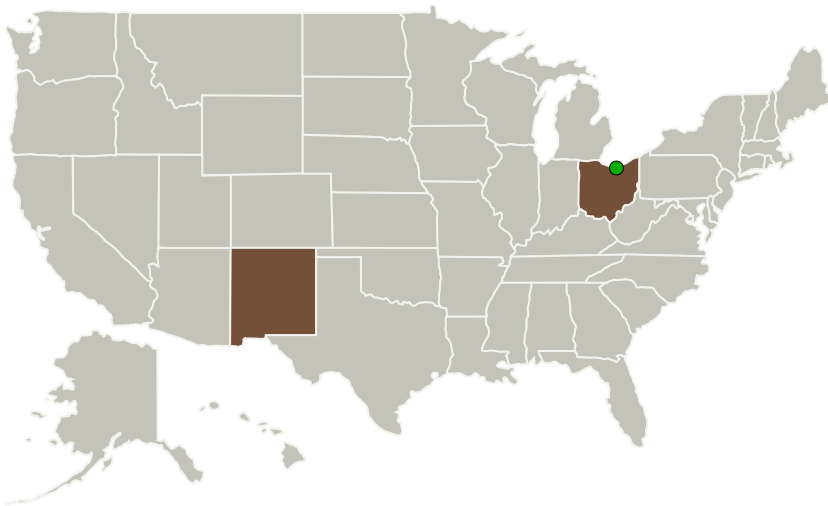
Completed Technology Project (2012 - 2012)



## Project Introduction

The Compound Specific Analyzer - Combustion Products is used on the International Space Station as a warning monitor of smoldering or combustion events and, after any fire event, to indicate that toxic gas levels have subsided for safe re-entry of the crew to the affected area. This monitor is being phased out of service. Southwest Sciences Inc. proposes to develop a replacement laser-based sensor using wavelength modulation spectroscopic absorption. This device would be capable of real-time measurements of the four most important gases of interest at concentration levels relevant to pre-combustion events and with a one second response time. This battery-operated device would be hand-held, use very little electrical power, and have a multi-year lifetime without the need for consumables, re-calibration, or maintenance, in contrast to the currently-used sensor. The Phase I research would perform a trade study and then test the most promising opto-mechanical designs for making simultaneous measurements of the four gases in a single optical cell with a minimal number of lasers. It would also demonstrate the ability to make multiple gas measurements over a wide range of concentrations using a single spectral scan. This work will allow us to design, test and build a prototype sensor in Phase II.

## Primary U.S. Work Locations and Key Partners



Improved Combustion Products Monitor for the ISS, Phase I

## Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Project Transitions	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	2
Technology Areas	3
Target Destinations	3

## Improved Combustion Products Monitor for the ISS, Phase I



Completed Technology Project (2012 - 2012)

Organizations Performing Work	Role	Type	Location
Southwest Sciences, Inc.	Lead Organization	Industry	Santa Fe, New Mexico
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
New Mexico	Ohio

## Project Transitions

**February 2012:** Project Start**August 2012:** Closed out**Closeout Documentation:**

- Final Summary Chart(<https://techport.nasa.gov/file/140309>)

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Organization:**

Southwest Sciences, Inc.

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

**Program Director:**

Jason L Kessler

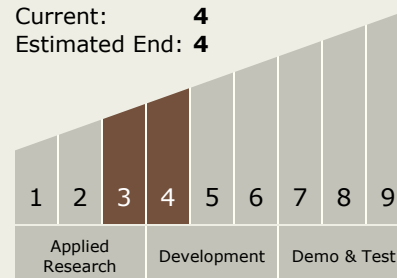
**Program Manager:**

Carlos Torrez

**Principal Investigator:**

Joel A Silver

## Technology Maturity (TRL)

Start: **3**Current: **4**Estimated End: **4**

# Improved Combustion Products Monitor for the ISS, Phase I

Completed Technology Project (2012 - 2012)



## Technology Areas

### Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - └ TX06.4 Environmental Monitoring, Safety, and Emergency Response
    - └ TX06.4.2 Fire: Detection, Suppression, and Recovery

## Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System